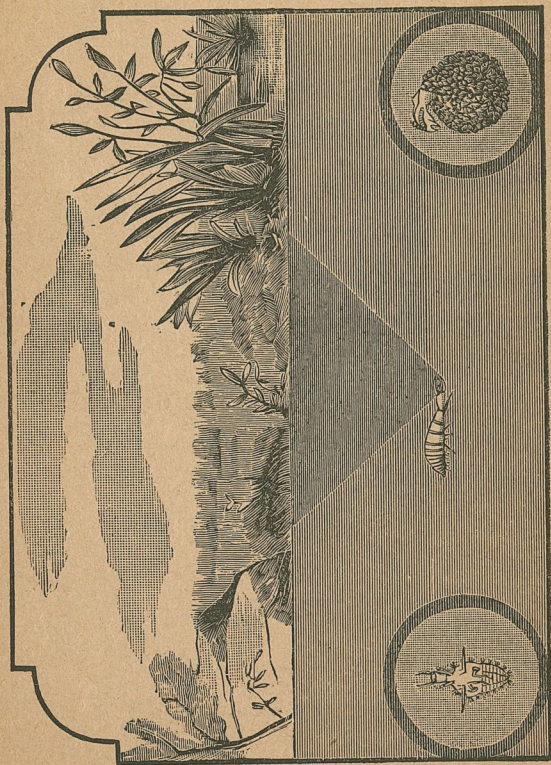


Some Curious Insects,

EDERHART.



ANT LION PIT. (Page 33.)

SOME CURIOUS INSECTS.

A Few Brief Sketches.

BY NOBLE M. EBERHART, B. S., PH. D.

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*To the parents who have so willingly aided me in
my studies, this little volume is affection-
ately dedicated by*

THE AUTHOR.

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Introduction.



This little work is not intended as a scientific treatise on the subjects included, but merely as an account of the habits and principal characteristics of the insects mentioned; written with the view of attracting the interest of people in general to the vast fields of knowledge and interesting research lying in the study of Entomology.

N. M. E.

THE PRAYING MANTIS.

The peculiar physical characteristics of this insect have given rise to many weird superstitions.

A number of marvelous stories are told about them by early writers. Says Mouffet: "They are called mantes, that is, fortune-tellers; either because by their coming they do show the spring to be at hand, so Anacreon, the poet, sang; or else they foretell death and famine, as Cælius, the scholiast of Theocritus, writes; or, lastly, because it always holds up its forefeet like hands, praying, as it were, after the manner of their diviners, who, in that gesture, did pour out their

supplications to their gods. So divine a creature is this esteemed, that if a childe aske the way to such a place, she will stretch out one of her feet and show him the right way, and seldom or never misse. As she resembleth these diviners in the elevation of her hands, so also, in likeness of motion, for they do not sport themselves as others do, nor leap, nor play; but walking softly, she returns her modestly, and shoves forth a kind of mature gravity."

The eggs of the mantis are deposited in an orange-colored case, having a length of about two inches, and composed of a substance resembling fine parchment.

In the interior of this mass (which is ordinarily fastened to the stem of some

plant), the eggs themselves are arranged in a double row.

The young mantes bear a strong resemblance to ants, both in form of body and in agility of movement.

The cannibal propensities are very strong in the mantis. Rösel relates that having a number of young mantes confined in a glass case, whenever, in their efforts to escape, they encountered one of their brothers, a combat was the immediate result, the victor always devouring his vanquished foe.

Rösel, thinking to stop this cannibalism, placed a number of ants in the case for food; but he had no sooner done so than he perceived his mistake, for the little mantes, although they had never seen an ant before, fled in wild alarm,

knowing by some strange intuition that the ants were their enemies. Later observations show that ants even fall upon the full-grown mantes and destroy them.

The Chinese, taking advantage of the fighting tendencies of these insects, keep them for this purpose, just as people of this country do game-cocks.

The fly is their principal article of food, and the way it is caught by the mantis is thus described by an English author:—"It raises its body, and lifting up and joining its two forefeet, it remains in the attitude of one praying. When the mantis espies a fly, even at a distance, it never takes off its bright green eye from its destined booty. The slightest variation in the movement of the fly is met by a corresponding one of

the eye, without moving the head of the mantis. If the fly should not approach sufficiently near, or if, on the contrary, it should betray any signs of removing altogether, the mantis drags its body so cautiously towards its prey as to be almost imperceptible to the observer; it then stretches itself as near as possible to the fly, without absolutely shifting its place; and when it has approached sufficiently near, the long claws, hitherto raised and folded up, are thrown upon the victim with the rapidity of lightning."

Rösel claims that the mantis will capture a fly at a distance of four inches.

After the fly is secured it is held up between the forefeet of the mantis, and devoured; it being stated that a male

will eat four flies daily, and a female six.

The superstitious Hottentots of South Africa, look upon a species found there as an omen of good luck, especially if the insect happens to alight upon one of them.

THE BURYING BEETLE.

Nearly everyone is familiar with this industrious beetle, and many have, perhaps, watched its operations.

Noticing that dead moles and other small animals laid on the loose ground soon disappeared, M. Gleditsch concluded to investigate the cause. Accordingly he placed a mole in the garden, and on the morning of the third day found it buried some three inches below the surface. Though wondering why this service was performed for the dead mole, yet as he saw only four beetles under the carcass he re-buried it, and in six days found it overrun with

maggots. It was not until then that the thought struck him that these maggots were the offspring of the beetles he had seen, and that they performed the burial rites in order to provide a place to deposit their eggs, where the young when hatched would have food for their nourishment.

Continuing his observations, M. Gleditsch placed four of these beetles under a glass case with two dead frogs. One pair buried the first frog in twelve hours, and on the third day the second one was similarly disposed of. The professor then gave them a dead linnet, and a pair of the beetles set to work to bury it. They pushed out the dirt from beneath the body. Then the male drove the female away and worked alone for about

five hours, turning the bird around in a more convenient position, and occasionally mounting the body to tread it down. After resting for an hour it proceeded as before, alternately excavating away the earth, and pulling the bird from below, and then treading it down from above. It was buried by the end of the third day. In fifty days the four beetles had buried four frogs, three small birds, two fishes, one mole, two grasshoppers, the entrails of a fish, and two morsels of the lungs of an ox.

Referring to our own note-book, we find the record of two of these beetles that dragged a dead field mouse some eighteen inches, to a deserted cray-fish's hole, and then pulled the carcass down into the hole, or rather one pulled while the other pushed from behind.

THE DEATH-WATCH.

"The wether's bell
Before the drooping flock tolled forth the knell,
The solemn death-watch clicked the hour she died!"

This little insect has probably been the source of more terror than anything in nature of equal size, for it is only about a quarter of an inch in length.

In appearance it generally bears a striking resemblance to the decayed wood in which it lives.

The superstitious idea has become firmly ingrained in the minds of the uneducated masses that the ticking of this strange little insect is portentive of the death of some member of the family.

It is this error which undoubtedly gave rise to the following from Swift:

"A woodworm

That lies in old wood, like a hare in her form,
With teeth or with claw, it will bite or will scratch;
And chamber-maids christen this worm a death-watch,

Because, like a watch, it always cries click:
Then wo be to those in the house who are sick—
For sure as a gun, they would give up the ghost
If the maggot cries click, when it scratches the post;
But a kettle of scalding hot water injected,
Infallibly cures the timber affected;
The omen is broken, the danger is over,
The maggot will die and the sick will recover."

The ticking of these insects is made by striking the head forcibly against whatever the insect is reposing upon, and the click is really only the call of the insect for its mate.

A Mr. Derham confined two of these

little fellows in a box, and carried on a number of experiments with them.

He found the number of beats to be generally between seven and eleven, and also found that by rapping on the table with a nail he could obtain an immediate response from one of the insects.

They abound in old houses, where they may frequently be heard during the day, but such is the thrilling distinctness of their call at night that the vulgar superstition is that they are heard only at midnight.

SEVENTEEN-YEAR LOCUSTS, ETC.

This peculiar insect has always attracted considerable attention, because of the various stories connected with it. Properly speaking, it should not be called a seventeen-year *locust*, but a seventeen-year cicada. However, the former name has become so firmly established that it is almost impossible to do away with it in common parlance.

It is hatched as a little grub from the egg which the mother has deposited on the twig of a tree, and drops to the ground, where it buries into the sap roots of the tree.

Here it remains for nearly seventeen

years, subsisting on the sap which it sucks up through its beak-like mouth.

When the seventeen years are nearly elapsed, it goes into the pupa, or transitory state, between the worm and the adult insect. This pupa stage lasts but a few days. As the time approaches for the change into the winged state, the pupa ascends to the surface, making a cylindrical tunnel, which is firmly cemented, and, to render it still more water-proof, is covered with a peculiar varnish.

It has been observed that where the ground is low or wet the pupa has extended its chamber some five or six inches above ground, but with an opening at the surface. This enables it to keep out of reach of all moisture. When the time for transition comes it backs

down below the surface and emerges through the opening, attaching itself to the most convenient object.

In a short time the skin splits along the back, the limbs are withdrawn, and in ten minutes the perfect cicada has freed itself from the pupa-case, which is left hanging where it was.

This transformation usually occurs between the hours of six and nine in the afternoon.

After first emerging the body is soft and white, except two spots on the front part of the thorax. In a short time, however, (generally less than an hour), the wings develop, and the natural colors begin to make their appearance.

The female is armed at the extremity of her abdomen with a sword-like ovi-

positor, or sheath, through which the eggs are discharged. When laying her eggs she makes a slit in the twig with this and deposits the eggs in pairs. It is this sharp ovipositor which has given rise to the popular superstition that these insects sting, but which is utterly false.

It has been estimated that the female cicada deposits about five hundred eggs; but such are the vicissitudes attendant upon the long underground life of the larva that it is supposed that only about one pair out of the two hundred and fifty reaches maturity.

Beneath the wings of the male, on the first ring of the abdomen, is a "musical" instrument which has been likened by some to a kettle-drum, and by others

to a violin, both similes being very apt. The noise produced by this arrangement is the call of the male for his spouse.

Doubtless all are familiar with the story that you can find your initials on the wings of this strange insect, and many of you have perhaps tried it. If so, you found near the apex of each wing a thickening of the veins, making a well defined letter W, out of which it is very easy to form a number of others with a little aid from the imagination.

Another story is that this W stands for war, while a third, evidently of oriental origin, is that Pharaoh's initials are to be found.

The ancient Greeks were very fond of the music of the cicadas, and kept them in cages on this account, giving the

same name to the sound of the harp and the chirp of the insect.

We quote the following from an English writer :—

“The symbol for music was a cicada sitting on a harp, which is said to have been founded on the following tale.

Two rival musicians, Enomus and Ariston, were alternately contending for the prize; when one of them had the misfortune to break a string of his lyre, a cicada immediately settled on his instrument, and supplied the defective string so efficiently by the melody of its own notes that the favorite candidate obtained the victory.”

So much attached were the Athenians to these insects that they wore golden images of them in their hair, and

used to boast that they, themselves, as well as the cicadas, were terræ filii, (sons of the earth).

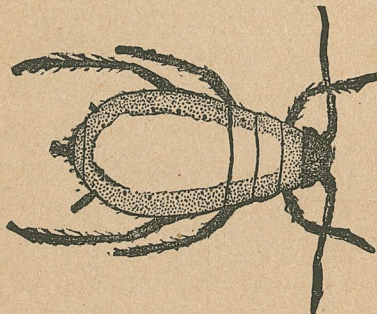
The fact of the cicada's music being confined to the male alone, gave rise to the following couplet of Xenorchus, the Rhodian poet :

“Happy the cicadas' lives,
Since they all have *voiceless wives*.”

A Chinese species yields a white wax, which is highly valued for candles, etc.

PLANT LICE.

Have you ever noticed some of the leaves on your rose-bush, curled or rolled



FEMALE PLANT LOUSE.

up in an odd manner, as if shrinking from the sunlight?

Noticing this, did you ever endeavor to satisfy your curiosity by investigating

the cause of this apparent diffidence? If you had taken the trouble to unroll one of these leaves you would have found a number of minute insects sheltered by its encircling folds. So small, indeed, are these insects that no adequate idea of their shape can be ascertained except by resorting to your microscope. Under the glass these little individuals assume definite proportions, and their bodies are found to be flask-shaped, with two little tubes projecting from the posterior portion of the abdomen.

Now, these two little tubes are of great importance, and insure careful treatment to many an aphid (as these little plant-lice are called); for from these tubes exudes a sweet fluid secreted by the stomach, which is highly prized by ants;

and to secure which, the ants tenderly watch over and care for the little aphidæ. They carry them out in the morning and place them on the leaves of some juicy plant, and then in the evening they bring them back to their own nests.

In return for this kindness, the aphidæ, when caressed by the antennæ, or "feelers," of the ant, emit this sweet fluid, which is greedily devoured by that industrious insect. This fact has caused the plant-lice to be frequently spoken of as "ants' cows."

They gain their livelihood from the juices of plants, which they suck up, and it is this depriving of the leaf of a part of its sap that causes it to curl up, thus protecting its enemy, and returning good for evil.

But the aphidæ is not without its enemies, for the little "lady bugs" ask for no daintier morsel than a nice, juicy plant-louse. Beside these, the larva of a species of lace-winged-fly has such a fondness for a diet of plant-lice that it has received the appellation of the aphidæ lion.

In Europe, gardeners frequently take the pains of hunting up a number of these aphidæ lions, which they place on their infested bushes, and as a result the plants are soon freed from plant-lice.

Now, the plant-louse differs from nearly all other insects in one respect.

It does not lay an egg from which are hatched little grubs that finally develop into mature insects, but instead, the females in the fall lay eggs which remain

over winter, and early in the spring hatch out, when it is found that, without a single exception, all are females.

Now comes the curious part, for these individuals bring forth *living* young, which, too, are only females, and are wingless. Generation number two follows the example of its predecessor, and so on until the approach of autumn, when a brood of perfect males and females is brought forth. The females of this brood lay eggs which remain over winter and undergo the same process as before.

M. Fougard says that the ordinary aphid produces ten generations during a year, and that each insect also brings forth about ten young ones, as seen in the following table:

Gen.	Produce.
1st.....	1 Aphis
2nd.....	100 Aphidæ
3rd.....	10,000 "
4th.....	1,000,000 "
5th.....	100,000,000 "
6th.....	10,000,000,000 "
7th.....	1,000,000,000,000 "
8th.....	100,000,000,000,000 "
9th..	10,000,000,000,000,000 "
10th.	1,000,000,000,000,000,000 "

So that from one aphid in the spring would come *one quintillion* in the fall, were it not for the many enemies to prevent this.

A striking example of this enormous increase is the following from Prof. Huxley:

"I will assume that an aphid weighs one one-thousandth of a grain, which

is under the mark ; a quintillion will on this estimate weigh a quadrillion of grains. He is a very stout man who weighs two million grains ; consequently the tenth brood alone, if all its members survive the perils to which they are exposed, contains more substance than five hundred million stout men ; to say the least, more than the whole population of China."

THE ANT-LION.

It is now our privilege to consider one of the most curious and interesting insects ever created.

The ant-lion is the larva of a neuropterous (nerve-winged) insect, much resembling the dragon-fly, but having broader and softer wings.

The larva is a very clumsy insect, with a broad, flat body and enormous jaws ; moreover, its legs are so constructed that it can only walk backwards, and that very slowly.

It lives in sandy districts, and is carnivorous in habits, subsisting principally on ants, which it catches alive.

This latter statement seems improbable when you look at the clumsy antlion and compare it with the agile ant. But what it is unable to accomplish by direct pursuit it is able to achieve by strategy.

It proceeds to make a funnel-shaped excavation in the sand, which serves the two-fold purpose of a nest and a pit-fall in which to catch its food.

It is very interesting to watch it in the construction of its habitation.

Selecting a suitable spot, it takes a few grains of sand on its head and jaws and by a quick backward jerk throws them far enough to prevent the possibility of their forming a ridge around the pit.

It proceeds, or rather *recedes*, (for it goes backwards) in a circle, when it

turns and makes another circle, gradually narrowing it, until it assumes the shape of a hollow, inverted cone.

The little insect, throughout its entire labors exhibits an unrivalled example of industry and perseverance.

If a pebble is encountered it is removed in a very skillful manner.

This has been so well described in a little work entitled "The Natural History of Insects," that we cannot do better than quote it :

"It frequently happens that small stones impede the progress of its labors; these are all, one by one, placed upon its head, and jerked beyond the outer margin of the excavation. But when arrived near the bottom, it sometimes encounters a pebble too large to be re-

moved even by this process, its head not having sufficient breadth and strength to bear so bulky and so heavy a substance; while the hole is too deep to admit of its being projected over the margin. In this dilemma the little engineer is not destitute of resources. A new mode of proceeding is adopted, suitable to the difficulty which the insect has to overcome. By a series of the most ingenious movements, it contrives to lift the pebble upon its back, were it is kept in a steady position by means of the segments which compose that part. Having thus secured the pebble from the chance of falling, the indefatigable laborer resolutely walks, tail forwards, up the slope of the excavation, and deposits its burden on the outside. When the stone

to be removed happens to be round, the insect's task becomes more arduous and difficult: in this emergency, the proceedings of the little ant-lion cannot fail to excite the deepest sympathy. With incredible exertion it lifts the pebble on its back; it then commences its retrograde ascent up the slope of the den; but at every step of its progress, the load may be seen to totter to one side or the other; but the expert porter elevates the segments of its back in order to restore the balance. It sometimes occurs, that, when it has very nearly reached the top of the excavation, a false step causes it to stumble; in this unlucky case, all its efforts are frustrated, and the stone rolls headlong to the bottom. Mortified, but not despairing, the unwearied ant-lion

returns to the charge; again places the stone on its back, and again ascends the sloping side, artfully availing itself of the channel which had been formed by the rolling stone—the sides of this channel frequently serving to support the load. Throughout the whole progress of the work, the insect shows itself a most expert engineer.”

M. Bonnet tells of one ant-lion, which instead of removing the stone in the above manner, simply forced it into the wall of the nest—an exceedingly ingenious way of disposing of it.

When, at length, the pit is completed, the ant-lion takes its place at the bottom, entirely buried in the sand, except its huge jaws, which are spread out in a horizontal direction.

The unlucky ant pauses on the brink, and in so doing is lost, for the loose sand gives way beneath its feet, and it falls to the bottom. Perchance, however, it may gain a footing and seemingly be about to escape; but no, the ant-lion immediately throws up a few grains of sand, which bring the unfortunate ant down with them.

Seizing its victim in its jaws, the ant-lion holds it above its head while it sucks the juices from its body, after which the carcass is thrown out and the nest repaired.

So much of an epicure is it that if a number of ants are thrown into the nest, it kills them all before selecting the one on which to make its repast.

One in the possession of Mr. Emerton fasted from October to March, a feat

which rather leaves Dr. Tanner in the shade.

It will devour almost any species of insect, except its own, but in no case will it touch one that it itself has not killed.

Reaumur deprived a bee of its wings and dropped it into the nest of an ant-lion. This insect seized the irritated bee by the back, and held it up in the air, so that it could not use its sting. At every effort the bee desperately made, the ant-lion would dash it violently against the side of the pit, until the exhausted bee finally yielded up its life, and the ant-lion feasted upon it at leisure.

When the ant-lion misses its food for sometime it decides that the locality is a poor one, and proceeds to seek another, where it constructs a new nest.

The ant-lion continues in this larva state for about two years, when it becomes a pupa. As this change approaches, it buries itself in the sand, and forms a globular cocoon of fine grains of sand cemented together with a viscid exudation from the pores of its skin, and lined with silken threads of its own spinning.

At the proper time it bursts this case and emerges. Says an English writer:

"Its four wings which were contracted in little folds, and whose dimensions did not exceed the sixth part of an inch in the film that sheathed them, begin to expand, and in the space of two minutes shoot into a greater length than the whole body. In a word the ravenous and malignant ant-lion assumes the form of a large and brilliant fly, much resembling

the Dragon-fly, which, after it has for some time continued immovable and apparently astonished at the prospect of nature, flutters its wings and enjoys a liberty unknown to it in its former obscure condition."



DEATH'S-HEAD MOTH.

THE DEATH'S-HEAD MOTH.

The death's-head moth has always been an object of interest, and many strange superstitions have gathered about it.

It is a large, dark-colored moth, with yellow markings, measuring about five inches from tip to tip of its extended wings.

On the thorax are pale markings which represent a hideous death's-head, whence the name of the insect.

The caterpillar is greenish yellow, with black spots on the back, and transverse lines of blue and white. It is our common potato, or tomato worm.

It made its first appearance in Europe a short time before the outbreak of the French Revolution, having been imported into that country with its native plant, the potato.

It was not long before it was found that this ominous-looking insect destroyed and devastated the hives of the bees, feeding on the honey it plundered from them.

It swooped down in the dead of night, making havoc of the hive, and resistance was in vain as the stings of the bees could not penetrate the soft downy covering of the moth.

The owners of bees tried various means to prevent the onslaught of this terrible enemy; but all in vain, and at last the bees solved the problem themselves.

They built a wall of wax with little loopholes in it, sufficiently large for their own ingress and egress, but not large enough to admit their enemy.

One of the strange characteristics of this peculiar insect is a plaintive squeaking sound which it emits, the manner of doing so, having as yet no satisfactory explanation.

On account of the piratical markings on its thorax it has always been regarded with superstitious dislike and aversion.

In Mauritius an idea is prevalent that it sheds a dust from its wings that causes immediate blindness if it falls upon a person. For this reason when one of them enters a habitation a scene of consternation ensues.

The pupa is quite interesting in its

form, resembling a jug in its shape. The long handle is commonly supposed to be the tail of the insect, but is in reality the tongue-case. This latter organ—the tongue—is of an extraordinary length to enable it to reach after the honey in flowers having a deep corolla. A Madagascar species has a tongue *nine and a quarter inches in length*.

The pupa is frequently found in digging in ground where potatoes or tomatoes have been planted.

INSECTS THAT GIVE LIGHT.

"Among the choked lanes, on every hedge
The glow-worm lights his gems; and through the
dark

A moving radiance twinkles."—*Thomson.*

The glow worm is usually found along the edges of paths and woods; the females are much more abundant than the males, and deposit their eggs on the grass and weeds during the months of June and July.

There are eleven rings or segments in the body of the worm, from the latter ones of which a phosphorescent light is capable of being emitted. This light looks like a couple of bright spots, if carefully examined.

In an old pamphlet we find the following account of the cleanliness of the glow-worm, which we herewith quote, although not vouching for any of the statements made :

"Having found the larva, when looking for objects of natural history in the neighborhood of Dartford, I placed it in my box and thinking it might be a vegetable feeder, I put some of the oak bark, moss, fern, and honeysuckle along with it.

Into the same box I afterward put several specimens of small snails, with pellucid shells, which I found in the same locality. When, on inspecting it the next day, I found that the vegetable substances I had placed with it were not touched, and that the snails had glued themselves to the top of the box. After

examining the insect for some time, I noticed that it made some very peculiar movements with its tail, in the manner of the common earwig and the devil's coach-horse, by bending up its tail over its back. There appeared to be something so uncommon in its movements, that my curiosity was excited to observe them more minutely; and, as the creature was not at all timid, I could easily observe it through a glass of some power. The caudal instrument, I discovered by this means, consists of a double row of cartilaginous rays, disposed in a circle, one row within the other, and what was most singular, these were retractile in a curious manner, to the horns of the snail. The rays were united by a soft, moist, gelatinous membrane, but so as to be in-

dividually extensile; one or two being frequently stretched beyond the line of the others. It was not long before I convinced myself that this singular instrument was employed by the insect for cleaning itself, and it would have been difficult to devise anything more effectual for the purpose, though its actions were different from all others of this kind with which I was acquainted, inasmuch as it is operated by suction, and not as a comb, a brush, or a wiper. It was moreover furnished in the interior with a sort of pocket of a funnel shape, formed by the converging rays, into which was collected the dirt, etc., from off the back of the insect."

In about twenty or twenty-one months the larvæ pupate, and some three weeks later they change into perfect insects.

